

The Fruit Flies (Diptera: Tephritidae) in Kurdistan Province, with New Records for Iranian Fauna

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Mohamadzade Namin S. & Nozari J. The fruit flies (Diptera: Tephritidae) in Kurdistan Province, with new records for Iranian fauna.

Summary. During studies on tephritid flies fauna in Kurdistan Province (Iran) in 2009–2010, 33 species of 16 genera are found to occur in this region. *Tephritis mesopotamica*, *Tephritis pulchra*, *Urophora cuspidata*, *U. quadrifasciata quadrifasciata* and *U. tenuis* are recorded for the first time for Iranian fauna. In addition, 8 host plants are reported as a new host plant for tephritid flies.

Key words: Diptera, Tephritidae, fruit flies, Iran, new records.

Мохамадзаде-Намин С. и Нозари Дж. Мухи-пестрокрылки (Diptera: Tephritidae) провинции Курдистан, с новыми находками для фауны Ирана. Резюме. В ходе изучения мух-пестрокрылок фауны провинции Курдистан (Иран) в 2009–2010 гг., установлено, что в районе исследований встречаются 33 вида из 16 родов. Впервые для фауны Ирана отмечены *Tephritis mesopotamica*, *Tephritis pulchra*, *Urophora cuspidata*, *U. quadrifasciata quadrifasciata* и *U. tenuis*. Кроме того, впервые в качестве кормовых растений пестрокрылок указаны 8 видов растений.

Ключевые слова: Diptera, Tephritidae, мухи-пестрокрылки, Иран, новые находки.

Мохамадзаде-Намин С. і Нозарі Дж. Мухи-осетниці (Diptera: Tephritidae) провінції Курдистан, з новими знахідками для фауни Ірану. Резюме. В ході вивчення мух-осетниць фауни провінції Курдистан (Іран) у 2009–2010 гг., встановлено, що в районі досліджень зустрічаються 33 види з 16 родів. Вперше для фауни Ірану відмічено *Tephritis mesopotamica*, *Tephritis pulchra*, *Urophora cuspidata*, *U. quadrifasciata quadrifasciata* та *U. tenuis*. Крім того, вперше в якості кормових рослин осетниць наведено 8 видів рослин.

Ключові слова: Diptera, Tephritidae, мухи-осетниці, Іран, нові знахідки.

Introduction

With about 4500 species, the family Tephritidae is one of the largest families of acalyptrate Diptera. Most species are phytophagous and cause economical damage to agricultural crops and some of them effectively used in biological control programs against weeds (White & Elson-Harris, 1992).

Kurdistan Province is located in North West of Iran near Iraq border with about 29,000 km². Before this study, little information was available on the tephritid flies of this region. Three species have been known up to date from

Kurdistan Province: *Goniurellia persignata* Freidberg (Mohamadzade, Nozari & Rasouljan, 2010 b), *Sphenella marginata* (Fallén) (Mohamadzade & Nozari, in press) and *Terellia korneyevorum* Mohamadzade Namin & Nozari (Mohamadzade, Nozari & Najarpour, 2011).

Material and methods

Materials are collected by standard sweeping net and rearing from flower heads of asteraceous plants. Species were identified with the keys by Hendel (1927), Freidberg & Kugler (1989), Merz (1994), Korneyev & White (1999) and White (1989).

All the material collected by first author and is deposited in the insect collection of Jalal Afshar Zoological Museum (JAZM) and first author's personal collection (SMNC).

Species recorded in Iran for the first time are marked with asterisks (*).

Results

In this study, thirty-one species from fifteen genera were collected in Kurdistan Province. *Tephritis mesopotamica* Korneyev & Dirlbek, *Tephritis pulchra* (Loew), *Urophora cuspidata* (Meigen), *U. quadrifasciata quadrifasciata* (Meigen) and *U. tenuis* Becker are recorded for the first time for Iranian fauna and all species are new for this region. In addition, 8 host plants are reported as a new host plant for tephritid flies. *Centaurea aggregata* is a new host plant for *Urophora affinis* Frauenfeld and *Urophora quadrifasciata quadrifasciata*; *Cousinia sanandajensis* is a new host plant for *Urophora tenuior* Hendel; *Cosmos bipinnatus*, *Centaurea amadanensis*, *C. aucheri*, *C. leuzeoides* and *C. nemecii* are new hosts for *Acanthiophilus helianthi* Rossi; and *Centaurea amadanensis* and *Lactuca serriola* are new hosts for *Terellia colon* (Meigen) and *Campiglossa producta* Loew respectively.

The subfamilies, tribes, genera and species are listed in alphabetic order. Detailed morphological descriptions are not given. For further information, refer to the works of Hendel (1927), White (1988), Freidberg & Kugler (1989), White & Elson-Harris (1992), Merz (1994) and Korneyev & White (1999).

List of species

Subfamily Dacinae

Tribe Dacini

Dacus ciliatus Loew, 1862

White & Elson-Harris, 1992.

Material examined. 1 ♀, Sanandaj, 30km to Kamyaran, 1440 m, N: 34°58.385, E: 46°59.149, 24.VIII.2009.

Host plants. Many species of Cucurbitaceae (White & Elson-Harris, 1992).

Distribution. Iran: Hormozgan, Markazi, Esfahan, Tehran, Khorasan Razavi (Parchami Araghi, 1995; Behdad, 2003; Gilasian, 2007; Haji Ghorbani, 2010); Senegal, Somalia, South Africa, Madagascar, Mauritius, Reunion, Egypt and Israel (Norrbon *et al.* 1999).

Subfamily Trypetinae

Tribe Carpomyini

Carpomya vesuviana Costa, 1854

Hendel, 1927.

Material examined. 1 ♀, Sanandaj, 30km to Kamyaran, 1440 m, N: 34°58.385, E: 46°59.149, 24.VIII.2009.

Host plants. *Ziziphus* spp. (Behdad, 1988)

Distribution. Iran: Gilan, Hormozgan, Tehran (Gilasian, 2007; Mohammadzade Namin, Nozari & Rasoulzadeh, 2010a); Italy, Bosnia, Turkmenistan, Uzbekistan, Tadjikistan, Pakistan, India, UAE and Thailand (Norrbon *et al.*, 1999).

Rhagoletis cerasi (Linnaeus, 1758)

Hendel, 1927; Rikhter, 1988; Korneyev & Merz, 1997.

Material examined. 1 ♀, Sanandaj, 30 km to Kamyaran, 1440 m, N: 34°58.385, E: 46°59.149, swept from cherry, 24.VIII.2009.

Host plants. *Prunus* spp. and *Lonicera* spp. (White & Elson-Harris, 1992; Merz, 1994).

Distribution. Iran: N., S., W. and E. (Afshar, 1937); Europe, Russia, Kazakhstan and Georgia (Norrbon *et al.*, 1999).

Subfamily Tephritinae

Tribe Myopitini

Urophora affinis (Frauenfeld, 1857) (Fig. 1)

Korneyev & White, 1999.

Material examined. 12 ♂, 8 ♀, Dezli, Uraman, Marivan, reared from flower heads of *Centaurea aggregata* (new host plant), date of collecting: 20.VI.2010, date of exit: 25-30.VI.2010.

Host plants. *Centaurea* spp. (Korneyev & White, 2000).

Distribution. Iran: Mazandaran (Dirlbek & Dirlbekova, 1974); from France to Russia and North America (Norrbon *et al.*, 1999).

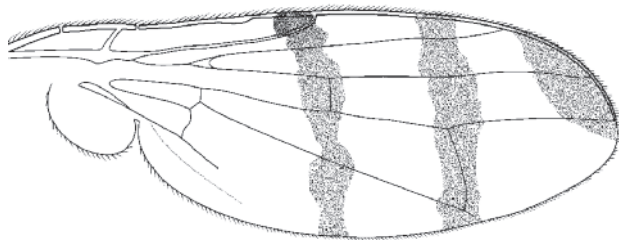


Fig. 1. *Urophora affinis*, wing.

Urophora cuspidata (Meigen, 1826)* (Figs. 2 & 7)

Korneyev & White, 1999.

Material examined. 1 ♂, 3 ♀, Saral, reared from flower heads of *Centaurea* sp., date of collecting: 18.VI.2010, date of exit: 20-22.IV.2011.

Host plants. *Centaurea* spp. (Korneyev & White, 1999).

Distribution. North and Central Europe to West Siberia and Caucasus (Norrbon *et al.*, 1999); Iran (**new record**).

Diagnosis. Wing with 4 black crossbands. Preapical and apical crossbands connected in anterior margin of the wing. Subbasal crossband not extending to posterior margin of the wing (Fig. 2). Mesonotal scutum covered with gray microtomentum. Femora and antennae yellow. Aculeus tip as in Fig. 7.

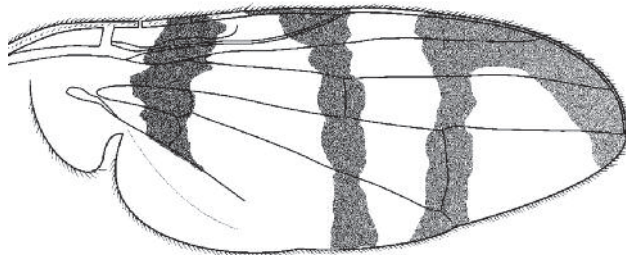


Fig. 2. *Urophora cuspidata*, wing.

***Urophora pauperata* (Zaitzev, 1945) (Fig. 3)**

Korneyev & White, 1999.

Material examined. 4 ♂, 3 ♀, Dezli, Uraman, Marivan, Kurdistan province, 2200 m, swept from flower heads of *Centaurea behen* (possible host plant), 6.VI.2010; 1 ♀, Hezar Kamian, 1920 m, 7.VI.2010.

Host plants. *Centaurea* spp. (Korneyev & White, 2000).

Distribution. Iran: West Azerbaijan (Karimpoor, 2006); Georgia and Turkey (Norrbom *et al.*, 1999).

Remark: *U. pauperata* is similar to *U. affinis* in its wing pattern with 3 widely separated crossbands (Fig. 3), differing in body length (5-5.2mm in *U. pauperata* and 3-3.2mm in *U. affinis*) and different host plants (*Centaurea* (*Calcitrapa*) spp. in *U. pauperata* and *Centaurea* (*Acrolophus*) and *C. (Phalolepis)* in *U. affinis*).

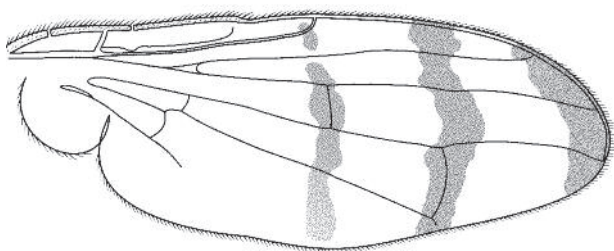


Fig. 3. *Urophora pauperata*, wing.

***Urophora quadrifasciata quadrifasciata* (Meigen, 1826)* (Figs. 4 & 6)**

Korneyev & White, 1999.

Material examined. 6 ♂, 5 ♀, Dezli, Uraman, Marivan, 1700 m, N: 35°19.655, E: 46°11.316, reared from flower heads of *Centaurea aggregata* (new host plant), date of collecting: 20.VI.2010, date of exit: 24-27.VI.2010.

Host plants. *Centaurea* spp. (Korneyev & White, 2000).

Distribution. England, France, Estonia, Tatarstan, Turkey, North America and Australia (Korneyev & White, 1999) (new record for Iran).

Diagnosis. Wing with 4 black crossbands. Subbasal and discal crossbands and preapical and apical crossbands connected in anterior margin of the wing. Subbasal crossband not extending to posterior margin of the wing (Fig.4). Mesonotal scutum shining. Aculeus length less than 2 mm and as in Fig. 6.

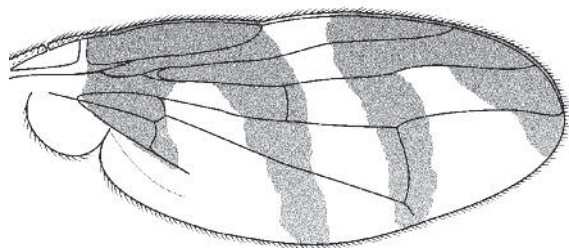


Fig. 4. *Urophora quadrifasciata quadrifasciata*, wing.

***Urophora quadrifasciata sjumorum* (Rohdendorf, 1937)**

Korneyev & White, 1999.

Material examined. 1 ♂, 3 ♀, Sanandaj, Abidar mountain, 17.VI.2010.

Host plants. *Centaurea* spp. (Korneyev & White, 1999).

Distribution. Iran: West Azerbaijan and Ardabil (Karimpoor & Merz, 2006; Mohamadzade Namin, Nozari & Najarpour, 2010); Cyprus, Turkey, Armenia, Azerbaijan, Uzbekistan, Turkmenistan, Tajikistan, Kazakhstan, Kirghizia, Israel, Pakistan and China (Norrbom *et al.*, 1999; Korneyev & White, 1999).

***Urophora tenuior* Hendel, 1910**

Korneyev & White, 1999.

Material examined. 3 ♀, Bijar, 2000 m, reared from flower heads of *Cousinia sanandajensis* (new host plant), date of collecting: 21.VII.2009, date of exit: 3.VIII.2009.

Host plants. *Cousinia mollis* (Korneyev & White, 2000).

Distribution. Iran: East Azerbaijan, Khorasan Razavi (Zaitzev, 1947; Gilasian, 2007); Turkmenistan and Afghanistan (Norrbom *et al.*, 1999).

***Urophora tenuis* Becker, 1908* (Figs. 5 & 8)**

Korneyev & White, 1999.

Material examined. 1 ♀, Dezli, Uraman, Marivan, 1700 m, N: 35°19.655, E: 46°11.316, swept from *Centaurea aggregata*, 20.VI.2010.

Host plants. *Serratula* spp. (Korneyev & White, 1999).

Distribution. Russia, Kazakhstan, Middle Asia, China and Mongolia (Korneyev & White, 1999) (new record for Iran).

Diagnosis. This species can be recognized from hyaline wings. First segment of flagellum and femora yellow and notopleural area black. Aculeus with two pairs of steps (Fig. 8) and wing length less than 3.5 mm.

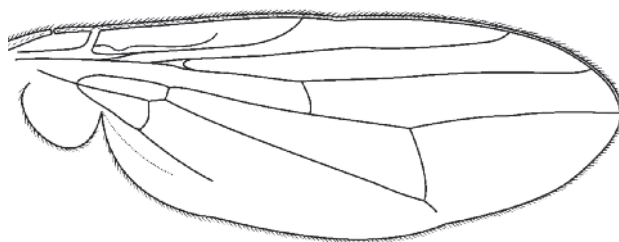
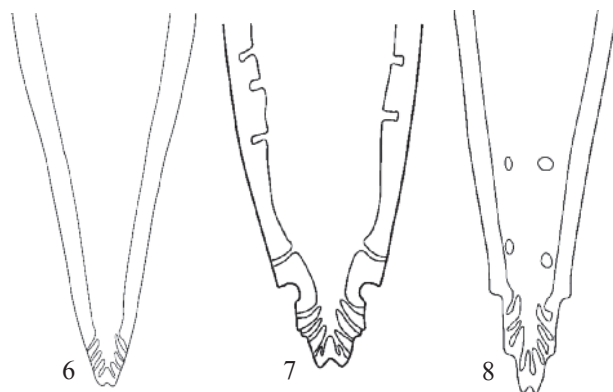


Fig. 5. *Urophora tenuis*, wing.



Figs. 6–8. *Urophora* aculeus tip: 6, *U. quadrifasciata quadrifasciata*, 7, *U. cuspidata*, 8, *U. tenuis*.

Tribe Nocetini

Hypenidium roborowskii (Becker, 1908)

Hendel, 1927.

Material examined. 1 ♀, Sanandaj, 5km to Ghorveh, Kurdistan province; 1800 m, N: 35°06.575, E: 47°56.613, reared from flower heads of *Lactuca* sp., date of collecting: 30.VII.2009, date of exit: 1.IX.2009.

Host plants. *Lactuca* sp. (Mohammadzade Namin, Nozari & Rasoulilian, 2010a).

Distribution. Iran: Ardabil, Tehran (Gilasian, 2007; Mohammadzade Namin, Nozari & Rasoulilian, 2010a); Syria, Jordan, Iraq, Afghanistan, Azerbaijan, Middle Asia, and China (Norrbom *et al.*, 1999; Korneyev & Dirlbek, 2000).

Tribe Tephritini

Acanthiophilus helianthi (Rossi, 1794)

Becker, 1913 (*Trupanea*); Hendel, 1927; Zaitzev, 1947; Foote, 1984; Freidberg & Kugler, 1989; Merz, 1994.

Material. 1 ♂, Sanandaj, 1400 m, N: 35°16.274, E: 47°01.779, 4.VI.2009; 1 ♀, Sanandaj, Abidar mountain, Mamatkeh, 1660 m, N: 35°18.819, E: 46°57.281, reared from flower heads of *Cosmos bipinnatus* (new host plant), date of collecting: 5.VI.2009, date of exit: 17.VI.2009; 1 ♂, 1 ♀, Sanandaj, Abidar mountain, 1940 m, N: 35°18.107, E: 46°56.488, reared from flower heads of *Centaurea amadanensis* (new host plant), date of collecting: 5.VI.2009, date of exit: 17.VI.2009; 3 ♂, 2 ♀, Sanandaj, Abidar mountain, 1940 m, N: 35°18.107, E: 46°56.488, reared from flower heads of *Centaurea nemecii* (new host plant), date of collecting: 5.VI.2009, date of exit: 12-16.VI.2009; 1 ♂, 1 ♀, Sanandaj, Abidar mountain, 1940 m, N: 35°18.107, E: 46°56.488, reared from flower heads of *Centaurea leuzeoides* (new host plant), date of collecting: 5.VI.2009, date of exit: 10-21.VI.2009; 3 ♂, 1 ♀, Saral, Dozakh Dareh, 2000 m, N: 35°42.623, E: 46°47.018, reared from flower heads of *Centaurea aucheri* (new host plant), date of collecting: 6.VI.2009, date of exit: 21.VI.2009; 31 ♂, 27 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, reared from flower heads of *Jurinea* sp., date of collecting: 6.VI.2009, date of exit: 12-19.VI.2009; 6 ♂, 12 ♀, Uraman, Marivan, 1700 m, N: 35°19.655, E: 46°11.316, 7.VI.2009.

Host plants. The larvae develop in flower heads of *Carthamus* spp. and *Centaurea* spp. (Merz, 1994; Mohammadzade Namin, Nozari & Rasoulilian, 2010 a).

Distribution. Iran: Ardabil, West and East Azerbaijan, Esfahan, Fars, Golestan, Hamedan, Khuzestan, Mazandaran, Sistan & Baluchestan, Tehran, Zanjan (Dirlbek & Dirlbekova, 1974; Gilasian, 2007); Europe, Syria, Saudi Arabia, UAE, Afghanistan, Thailand and Africa (Norrbom *et al.*, 1999; Korneyev & Dirlbek, 2000; Merz & Dawah, 2005; Merz, 2008).

Campiglossa producta (Loew, 1844)

Hendel, 1927; Zaitzev, 1947; Dirlbek, 1980 (*Paroxyna tessellata*); Freidberg & Kugler, 1989 (*Paroxyna*); Norrbom *et al.*, 1999.

Material examined. 1 ♂, Sanandaj, Abidar mountain, Mamatkeh, 1660 m, N: 35°18.819, E: 46°57.281, 4.VI.2009; 1 ♂, 1 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 6.VI.2009; 1 ♂, Sanandaj-Marivan road, Jhavroud, 1370 m, N: 35°14.156, E: 45°29.187, 7.VI.2009; 1 ♂, Uraman, Marivan, 2200 m, 7.VI.2009; 1 ♂, 1 ♀, Bijar, 2000 m, reared from flower heads of *Lactuca serriola* (new host plant), date of collecting: 20.VII.2009, date of exit: 30.VII.2009; 1 ♂, Sanandaj-Marivan road, Jhavroud, 1370 m, N: 35°14.156, E: 45°29.187, 7.VI.2009; 12 ♂, 1 ♀, Sanandaj, Abidar mountain, Mamatkeh, 1660 m, N: 35°18.819, E: 46°57.281, 17.VI.2010; 1 ♂, 2 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 18.VI.2010.

Host plants. *Chondrilla juncea*, *Crepis* spp., *Leontodon* spp., *Hieracium* spp. (Merz, 1994).

Distribution. Iran: Ardabil, Fars, Golestan, Khuzestan, Lorestan,

Tehran, West and East Azerbaijan (Gilasian, 2007; Mohammadzade Namin, Nozari & Rasoulilian, 2010 b); N Africa, Canary Is., central and southern Europe, Middle Asia, Israel, Syria, Jordan, Iraq and Afghanistan (Norrbom *et al.*, 1999; Korneyev & Dirlbek, 2000).

Sphenella marginata (Fallén, 1814)

Freidberg & Kugler, 1989.

Material examined. 1 ♂, Sanandaj, Abidar mountain, 1940 m, N: 35°18.107, E: 46°56.488, 4.VI.2009; 1 ♂, Marivan, Uraman, 1700 m, N: 35°19.655, E: 46°11.316, 7.VI.2009; 2 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 6.VI.2009.

Host plants. *Senecio* spp. (Merz, 1994)

Distribution. Iran: Kurdistan (Mohammadzade Namin & Nozari, in press); Europe, Asian Russia (West Siberia), Egypt, Israel and Afghanistan (Norrbom *et al.*, 1999; Freidberg & Kugler, 1989).

Tephritis formosa (Loew, 1844)

Freidberg & Kugler, 1989.

Material examined. 1 ♂, Saral, Divan Dareh, 50km to Ghorveh, 15.VI.2010.

Host plants. In Europe reared from *Sonchus* spp., *Hypochaeris radicata* and *Crepis virens* (Merz, 1994).

Distribution. Iran: Ardabil, Mazandaran, Tehran (Dirlbek & Dirlbekova, 1974; Mohammadzade Namin, Nozari & Najarpour, 2010; Mohammadzade Namin, Nozari & Rasoulilian, 2010a); Europe, except Scandinavia, to Israel (Norrbom *et al.*, 1999).

Tephritis hurvitzii Freidberg, 1981

Hendel, 1927 (*Tephritis recurrens*, pro parte); Freidberg & Kugler, 1989; Merz, 1994.

Material examined. 25 ♂, 17 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 24.VIII.2009; 1 ♂, Sanandaj, Abidar mountain, 1940 m, N: 35°18.107, E: 46°56.488, 17.VI.2010.

Host plants. The larvae develop in stem galls on *Scorzonera syriaca* and *Tragopogon longirostris* (Freidberg & Kugler, 1989).

Distribution. Iran: Ardabil, West Azerbaijan, Tehran (Gilasian, 2007; Mohammadzade Namin, Nozari & Najarpour, 2010; Mohammadzade Namin, Nozari & Rasoulilian, 2010a); Greece, Ukraine, Cyprus, Turkey, Israel, Syria, Jordan, Lebanon, Iraq, Armenia, Azerbaijan, Kazakhstan, Uzbekistan and Kyrgyzstan (Norrbom *et al.*, 1999; Korneyev & Dirlbek, 2000).

Tephritis mesopotamica Korneyev & Dirlbek, 2000*

(Figs. 9, 11 & 12)

Korneyev & Dirlbek, 2000.

Material examined. 1 ♂, 1 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 24.VIII.2009.

Host plants. Not known.

Distribution. Iraq (Korneyev & Dirlbek, 2000); Iran (new record).

Diagnosis. Wing pattern brownish and reticulate. r_1 cell without small hyaline spot in apical brown part. Cell r_1 with two large hyaline spots and 3 hyaline spots in r_{2+3} cell

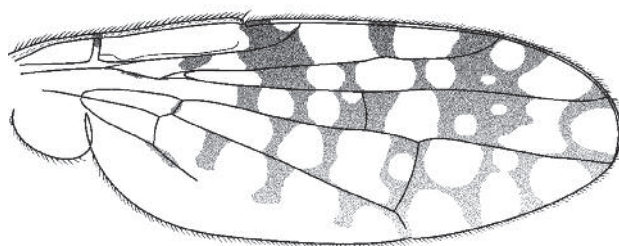


Fig. 9. *Tephritis mesopotamica*, wing.

posterior of two large hyaline spots of r_1 cell. Brown spot at apex of R_{4+5} and M_{1+2} connected with main spot (Fig. 9). Aculeus shape as in Figs. 11 and 12.

Tephritis postica (Loew, 1844)

Freidberg & Kugler, 1989.

Material examined. 2 ♂, 3 ♀, Sanandaj, 1400 m, N: 35°16.274, E: 47°01.779, reared from flower heads of *Onopordon acanthium*, date of collecting: 5.VI.2009; date of exit: 15.VI.2009; 1 ♂, Saral, Divan Dareh, 50km to Ghorveh, 15.VI.2010.

Host plants. *Onopordon cynarocephalum* (Freidberg & Kugler, 1989).

Distribution. Iran: Esfahan, Hamedan, Kermanshah, Khorasan Razavi, Semnan, Tehran, Zanjan, Ardabil (Gilasian, 2007; Mohamadzade Namin, Nozari & Najarpour, 2010); South to North Africa, France, cent. Europe, Ukraine, Israel and Uzbekistan (Norrbon *et al.*, 1999).

Tephritis pulchra (Loew, 1844) (Figs. 10, 13 & 14)

Freidberg & Kutuk, 2002.

Material examined. 2 ♂, 3 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 24.VIII.2009.

Host plants. *Scorzonera* spp. (Freidberg & Kutuk, 2002).

Distribution. Cent. & S. Europe to Turkey and North Africa (Norrbon *et al.*, 1999) (new record for Iran).

Diagnosis. Wing pattern blackish and reticulated. r_1 cell with small hyaline spot in apical brown part. Cell r_1 with two large hyaline spots. Hyaline spots in r_{2+3} cell not con-

nected to two large hyaline spots of r_1 cell. Brown spot at apex of R_{4+5} and M_{1+2} connected with main spot (Fig. 10). Aculeus tip with one pair of distinct steps (Fig. 14).

Tephritomyia lauta (Loew, 1869)

Dirlbek, 1980.

Material examined. 1 ♂, 2 ♀, Sanandaj, Abidar mountain, Matkeh, 1660 m, N: 35°18.819, E: 46°57.281, 4.VI.2009; 1 ♂, 1 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 24.VIII.2009.

Host plants. Flower heads of *Echinops viscosus* (Freidberg & Kugler, 1989).

Distribution. Iran: Ardabil and Tehran (Mohamadzade Namin, Nozari & Najarpour, 2010; Mohamadzade Namin, Nozari & Rasouljan, 2010a); Greece, Israel, Iran, Tunisia and Egypt (Norrbon *et al.*, 1999).

Trupanea amoena (Frauenfeld, 1857)

Hendel, 1927; Zaitzev, 1947; Dirlbek, 1980; Freidberg & Kugler, 1989.

Material examined. 1 ♀, Bijar, 2000 m, reared from flower heads of *Lactuca serriola*, date of collecting: 23.VII.2009, date of exit: 4.VIII.2009; 3 ♂, 1 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 24.VIII.2009.

Host plants. *Lactuca* spp., *Picris hieracioides* and *Sonchus* spp. (Merz, 1994).

Distribution. Iran: Ardabil, East Azerbaijan, Khorasan Jonubi, Sistan va Baluchestan, Tehran (Zaitzev, 1947; Hering, 1956; Gilasian, 2007; Mohamadzade Namin, Nozari & Najarpour, 2010); Central and southern Europe, Israel, Syria, Iraq, Saudi Arabia and UAE (Norrbon *et al.*, 1999; Korneyev & Dirlbek, 2000; Merz, 2005; Merz, 2008).

Trupanea stellata (Fuesslin, 1775)

Becker, 1913; Hendel, 1927; Zaitzev, 1947; Dirlbek, 1980; Freidberg & Kugler, 1989.

Material examined. 1 ♀, Dezli, Uraman, Marivan, 1700 m, N: 35°19.655, E: 46°11.316, 17.VI.2009; 1 ♂, Sanandaj, Little Abidar Mountain, 1950 m, N: 35°17.542, E: 46°57.931, 6.VI.2009; 1 ♀, Sanandaj, Little Abidar Mountain, 1800 m, N: 35°17.495, E: 46°58.179, reared from flower heads of *Senecio vulgaris*, date of collecting: 16.VI.2009; date of exit: 22.VI.2009; 1 ♂, 2 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, reared from flower heads of *Senecio* sp., date of collecting: 8.VI.2009; date of exit: 17.VI.2009.

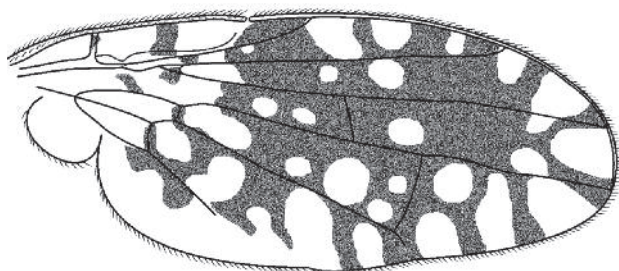
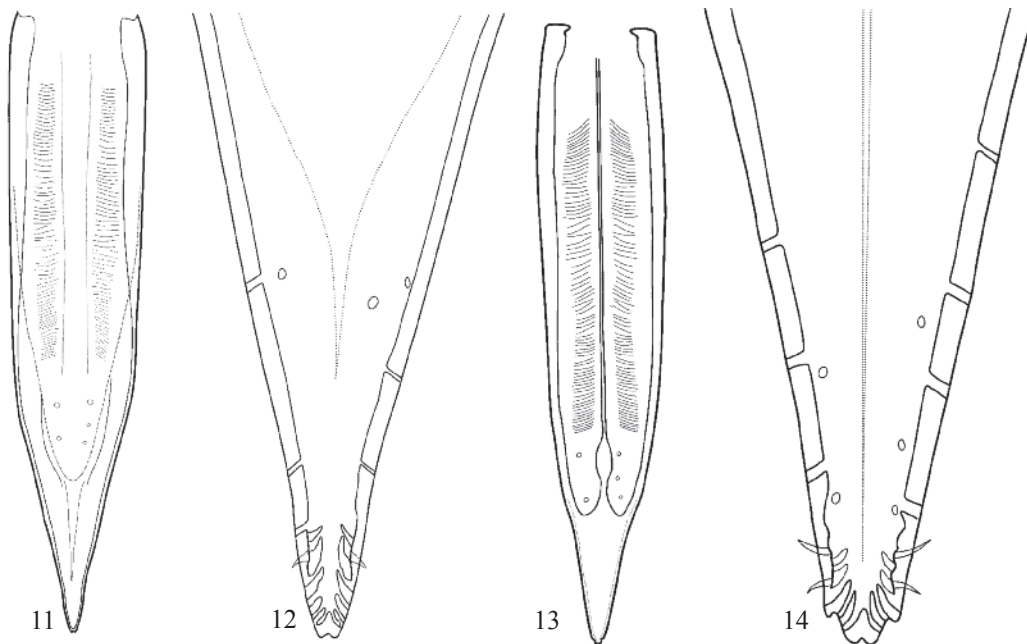


Fig. 10. *Tephritis pulchra*, wing.



Figs. 11-14. *Tephritis* aculeus: 11-12, *T. mesopotamica*; 13-14, *T. pulchra* (12, 14 - apex, enlarged).

Host plants. The larvae develop in flower heads of *Anthemis* spp., *Artemisia judaica*, *Aster* sp., *Bidens* sp., *Centaurea* spp., *Crepis* spp., *Inula* spp., *Picris* sp., *Senecio* spp. and *Serratula* sp. (Freidberg & Kugler, 1989; Merz, 1994).

Distribution. Iran: Ardabil, Kerman, Kermanshah, Sistan va Baluchestan, Tehran, East and West Azerbaijan, (Dirlbek, 1980; Gilasian, 2007; Mohamadzaade Namin, Nozari & Najarpour, 2010) South to North Africa, Central and southern Europe, Israel, Iraq, Armenia, Saudi Arabia, India and Mongolia (Norrbon *et al.*, 1999; Korneyev & Dirlbek, 2000; Merz, 2005).

Tribe Terelliini

Chaetorellia sp. near *australis* Hering, 1940

White & Marquardt, 1989.

Material examined. 1 ♂, 3 ♀, Sanandaj, Abidar mountain, Matkeh, 1660 m, N: 35°18.819, E: 46°57.281, 17.VI.2010, reared from flower heads of *Centaurea aucheri*, date of collecting: 17.VI.2010, date of exit: 25.VI.2010.

Remarks. This species is similar to *C. australis* in following characters: anterior supra-alar seta based on yellow ground and discal and preapical crossbands joined in anterior margin of the wing; but aculeus length is more than 2mm and aculeus tip is not as acute as in *C. jaceae*.

Chaetostomella sp. near *cylindrica* (Robineau-Desvoidy, 1830)

Korneyev, 1986.

Material examined. 4 ♂, 5 ♀, Dezli, Uraman, Marivan, reared from flower heads of *Cousinia* sp., date of collecting: 20.VI.2010, date of exit: 3.VII.2010.

Orellia falcata (Scopoli, 1763)

Korneyev, 2003.

Material examined. 1 ♂, 1 ♀, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, swept from flower heads of *Tragopogon* sp., 7.VI.2009.

Host plants. *Tragopogon longirostre* (Freidberg & Kugler, 1989).

Distribution. Iran: Markazi, East Azerbaijan (Haji Ghorbani, 2010; Gilasian, 2007) and Tehran (Mohamadzaade Namin, unpublished data); Throughout Europe, Russia, Israel and Central Asia (Norrbon *et al.*, 1999).

Orellia stictica (Gmelin, 1790)

Korneyev, 2003.

Material examined. 1 ♂, 1 ♀, Ubato, 2300 m, N: 36°04.592, E: 46°49.660, 7.VI.2009.

Host plants. Larvae in flower heads *Tragopogon* spp. (Valery Korneyev, personal communication)

Distribution. Iran: Golestan, Mazandaran and Tehran (Dirlbek & Dirlbekova, 1974; Gilasian, 2007; Mohamadzaade Namin, Nozari & Rasoulilian, 2010a); France, Germany, Bulgaria, Sweden and Ukraine (Norrbon *et al.*, 1999).

Terellia gynaecochroma (Hering, 1937)

Rikhter, 1988; Freidberg & Kugler, 1989 (as *Orellia lappae*).

Material examined. 15 ♂, 9 ♀, Sanandaj-Marivan road, Jhavroud, 1370 m, N: 35°14.156, E: 45°29.187, swept from flower heads of *Onopordon acanthium*, 7.VI.2009; 7 ♂, 4 ♀, Bijar, 2000 m, 8.VI.2009.

Host plants. *Onopordum* spp. (Rikhter, 1988; Freidberg & Kugler, 1989) (as *Orellia lappae*).

Distribution. Iran: Ardabil, Fars, Kurdistan, Qazvin and Tehran (Gi-

lasian, 2007; Mohamadzaade Namin, Nozari & Rasoulilian, 2010 a); Central and Southern Europe, Cyprus, Israel, Jordan and Syria (Freidberg & Kugler, 1989; Norrbom *et al.*, 1999; Korneyev & Dirlbek, 2000).

Terellia colon (Meigen, 1826)

Material examined. 4 ♂, 3 ♀, Sanandaj, Abidar mountain, 2000 m, N: 35°18.107, E: 46°56.488, reared from flower heads of *Centaurea amadanensis* (new host plant), date of collecting: 5.VI.2009, date of exit: 16.VI.2009; 2 ♂, Uraman, Marivan, 1700 m, N: 35°19.655, E: 46°11.316, 7.VI.2009.

Host plants. *Centaurea* spp. (Rikhter, 1988).

Distribution. Iran: West Azerbaijan (Karimpoor, 2006); North Africa, Britain, Sweden, Russia, Israel and Kazakhstan (Norrbon *et al.*, 1999).

Terellia serratulae (Linnaeus, 1758)

Dirlbek & Dirlbeková, 1974 (*Terellia longicauda* — misid.); Dirlbek, 1980; Freidberg & Kugler, 1989; Korneyev & Dirlbek, 2000.

Material examined. 3 ♂, Sanandaj, Abidar mountain, 2000 m, N: 35°18.107, E: 46°56.488, 16.VI.2009; 2 ♂, Saral, Ghojr, 2110 m, N: 35°45.831, E: 46°58.316, 18.VI.2009.

Host plants. *Carduus* spp., *Cirsium* spp. (Rikhter, 1988; Freidberg & Kugler, 1989; Merz, 1994) and *Carduus onopordioides* (Mohamadzaade Namin, Nozari & Najarpour, 2010).

Distribution. Iran: Ardabil, Gilan, Khorasan, Kohkiluyeh va Boyer Ahmad, Mazandaran, Tehran, West Azerbaijan (Becker, 1913; Gilasian, 2007; Mohamadzaade Namin, Nozari & Najarpour, 2010; Mohamadzaade Namin, Nozari & Rasoulilian, 2010a); British Is., Scandinavia and Kazakhstan S to N Africa, Israel, Syria and Iraq (Norrbon *et al.*, 1999; Korneyev & Dirlbek, 2000).

Terellia uncinata White, 1989

White, 1989.

Material examined. 4 ♂, 1 ♀, Saral, Dozakh Dareh, 2000 m, N: 35°42.623, E: 46°47.018, reared from flower heads of *Centaurea solstitialis*, date of collecting: 18.VI.2009, date of exit: 2.VII.2009.

Host plants. *Centaurea nicaeensis* and *C. solstitialis* (White, 1989).

Distribution. Iran: Arak, Ardabil (Haji Ghorbani *et al.*, 2010; Mohamadzaade Namin, Nozari & Najarpour, 2010); Italy, Albania, Bulgaria, Greece and Turkey (Norrbon *et al.*, 1999).

Terellia zerovae Korneyev, 1985

Korneyev, 1985; White, 1989.

Material examined. 18 ♂, 15 ♀, Sanandaj, Abidar mountain, Matkeh, 1660 m, N: 35°18.819, E: 46°57.281, 17.VI.2010.

Host plants. *Centaurea argentea*, *C. diffusa*, *C. maculosa*, *C. calcitrapa*, *C. iberica*, *C. solstitialis* (White, 1989) and *C. aucheri* (Mohamadzaade Namin, Nozari & Najarpour, 2010 b).

Distribution. Iran: Ardabil (Mohamadzaade Namin, Nozari & Najarpour, 2010); Romania, Greece, Turkey, Tadzhikistan (Norrbon *et al.*, 1999).

Acknowledgements

We wish to express our sincere thanks to Valery A. Korneyev (Schmalhausen Institute of Zoology, NAS of Ukraine) for confirmation of identification of specimens, review of this manuscript and valuable comments. We also thank Hamed Ghobari (University of Kurdistan) for his assistance during fieldwork. We also appreciate corrections and comments made by an anonymous reviewer.

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